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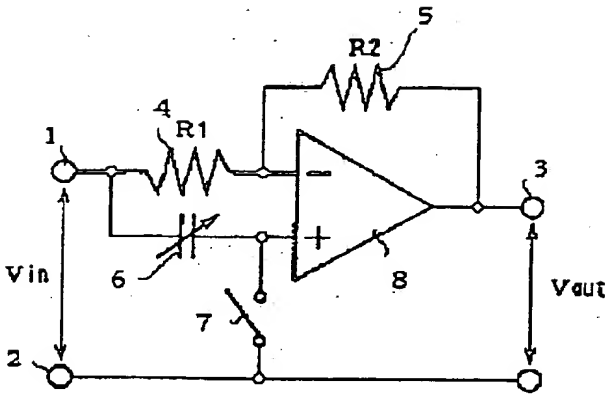
TITLE : CAPACITANCE TYPE PHYSICAL QUANTITY DETECTING DEVICE



ABSTRACT : PURPOSE: To suppress voltage fluctuation across counterposed electrodes and prevent the electrodes from coming contact with each other so as to easily make a sensor more precise by detecting the capacitance change of a capacitance sensor under a low applied-voltage condition by using an operational amplifier.

CONSTITUTION: Resistors R_1 and R_2 are respectively connected between an input terminal 1 and the inverted input terminal of an operational amplifier 8 and between the inverted input terminal and an output terminal 3. In addition, a capacitance sensor 6 and switch 7 are respectively connected between the terminal 1 and the non-inverted input terminal of the amplifier 8 and between the non-inverted input terminal and a common terminal 2. By closing the switch 7, the sensor 6 is charged with a voltage Vin and, at the same time, a physical quantity to be measured, for example, reference acceleration is impressed upon the sensor 6. When a physical quantity to be measured, for example, acceleration is impressed upon the sensor 6 and the capacitance value of the sensor 6 becomes C1, the voltage variation $\Delta V=Vin-Vout$ of the sensor 6 becomes $\Delta V=(1+(R_2/R_1)).(\Delta C/C1).Vin$. Therefore, when the resistance values of the resistors R_1 and R_2 are appropriately set, the variation $\Delta C/C1$ of the capacitance can be largely amplified with a small voltage change V.